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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,356	07/29/2003	Pierre Lespade	240822US0	4492
22850	7590	05/17/2006		
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER FLETCHER III, WILLIAM P	
			ART UNIT	PAPER NUMBER

1762

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/628,356

Applicant(s)

LESPADE ET AL.

Examiner

William P. Fletcher III

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 12-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☒ Claim(s) 4-11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/24/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. The examiner has not located a preliminary amendment in the application file. The examiner presumes that no preliminary amendment has been filed.
2. Claims 1-15 are pending.

### *Election/Restrictions*

3. Applicant's election with traverse of claims 1-11 in the reply filed on 4/11/2006 is acknowledged. The traversal is on the ground(s) that: (i) the examiner has given no reason to support the proposition that the process claims could be modified in the ways suggested and still produce the product claims; and (ii) because "thousands of U.S. patents have been issued in which many more than two subclasses have been searched," the Office cannot reasonably assert that a burden exists in searching only two subclasses. This is not found persuasive.

A. With respect to (i), applicant's attention is directed to MPEP § 2113 where the peculiar nature of product-by-process claims is discussed. The product formed by the process claims need only be a refractory material having a layer of dried, cross-linked, carbonized resin containing the recited borides, carbides, or borocarbides, with the recited coke content, coated beneath a layer of melt-coated silicon. Clearly, such a product may be made by any process that results in such an arrangement of layers and materials, not just the claimed process. This is the reasoning behind the conclusion that the two groups of inventions are independent and distinct. As explained in MPEP § 803(II), examiners must provide reasons and/or examples to support conclusions, but need not cite documents to support the restriction requirement in most cases.

The examiner has, therefore, set forth a *prima facie* case for restriction consistent with USPTO practices and procedures. In asserting only that the examiner has not supported his

Art Unit: 1762

conclusion (an assertion which, as demonstrated above, is inaccurate), applicant's argument does not weigh against the *prima facie* case of record. As explained in MPEP § 818, a traverse of a requirement to restrict is a statement of the reasons upon which the applicant relies for his or her conclusion that the requirement is in error. Further, as explained in MPEP § 2113, the Patent Office bears a lesser burden of proof in making out a case of *prima facie* obviousness for product-by-process claims because of their peculiar nature than when a product is claimed in the conventional fashion. Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. While this policy specifically concerns comparison of a product-by-process claim with the prior art, it clearly extends to restriction practice as well. The burden is on applicant to come forward with evidence establishing that the product-by-process claims are not distinct from the process claims.

B. With respect to (ii), for purposes of the initial requirement, a serious burden on the examiner may be *prima facie* shown if the examiner shows by appropriate explanation of separate classification, or separate status in the art, or a different field of search as defined in MPEP § 808.02. As set-forth in the prior Office action, process claims 1-11 require a search in class 427, including at least subclass 448, while article claims 12-15 require a search in class 428, including at least subclass 408, where process is irrelevant (see MPEP § 2113). The burden on the examiner further extends to the patentability issues associated with, and evolving as a result of, searching additional inventions. Issues related to a process are frequently very different from those related to an article. For example, the issues related to the structural or functional

Art Unit: 1762

requirements of an article need not be familiar to an examiner of specific processes. Consequently, examination of process claims 1-11 and article claims 12-15 present a serious burden on the examiner both because of (1) a divergent or non-overlapping search related to the separate classification of the inventions, as well as the nature of claims 12-15 as product-by-process claims, and (2) the evolution of patentability issues related to searching multiple and distinct inventions.

C. The requirement is still deemed proper and is therefore made FINAL.

***Priority***

4. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Information Disclosure Statement***

5. The information disclosure statement (IDS) submitted on 10/24/2003 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

***Specification***

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

7. The abstract of the disclosure is objected to because it is too long and it spans more than one paragraph. Correction is required. See MPEP § 608.01(b).

8. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a

Art Unit: 1762

basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

9. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

Art Unit: 1762

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or  
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

10. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: PROCESS FOR MANUFACTURING A PROTECTIVE COATING OF REFRACTORY MATERIAL ON A SUBSTRATE.

11. The use of numerous trademarks has been noted in this application. Trademarks should be capitalized wherever they appear and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

***Claim Interpretation***

12. Consistent with USPTO practice and procedure concerning transitional phrases as detailed in MPEP § 2111.03, the examiner interprets the phrase “Process for manufacturing a refractory material, characterized in that it comprises the following steps” as “Process for manufacturing a refractory material comprising the following steps.” The term “containing” is also interpreted as “comprising.”

13. Further, the examiner interprets the phrase “steps a) and b)...” as “wherein steps a) and b)...”.

***Claim Objections***

14. Claims 4-11 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from another multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims not been further treated on the merits.

15. Claims 1-3 are objected to because of minor informalities. Appropriate correction is required. The examiner suggests correction of the informalities as indicated below.

***Claim Rejections - 35 USC § 112***

16. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

17. **Claims 1-3 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for carbonization of a cross-linked resin and covering of a carbonized, cross-linked resin, does not reasonably provide enablement for carbonization of a non-cross-linked resin or covering of a non-carbonized and/or non-cross-linked resin.**



Art Unit: 1762

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

A. Claim 1, as written, does not specify any particular order of steps and is open to step c) being performed either before or after step b). Similarly, claim 1, as written, is open to step e) being performed before even step c). The specification discloses only carbonization of a cross-linked resin (i.e., c) after b)). Consequently, the specification does not enable step b) being performed before step c). Further, the specification discloses only covering a cross-linked, carbonized resin (i.e., e) after c) and d)). Consequently, the specification does not enable step e) being performed at any other time, including before step c).

B. Since dependent claims necessarily incorporates all of the limitations of the claim(s) from which they depend, claims 2 and 3 are similarly rejected.

# # #

18. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

19. **Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

A. Claim 1 recites “steps a) and b) possibly being repeated one or more times before going onto step c).” This limitation is indefinite because the term “possibly” makes it unclear whether or not this limitation is actually part of the claim. same with other also cross-link at the same time?

Art Unit: 1762

B. Claims 1 and 3 recite “chosen from among x, y,...and z.” This recitation is indefinite because it is unclear what elements are included/excluded from the group. See MPEP § 2173.05(h) for examples of appropriate alternative recitations.

C. Since dependent claims necessarily incorporates all of the limitations of the claim(s) from which they depend, the metes and bounds of the claimed subject matter are impossible to determine.

**\*\*\*The examiner suggests the following amendments to the claims to resolve the above-mentioned objections and rejections, with the exception of the improper multiple-dependency of claims 4-11.\*\*\***

**Claim 1 (currently amended)** A process for manufacturing a refractory material, ~~[[characterized in that it comprises]]~~ comprising the following steps:

(a) ~~[[deposit]]~~ depositing, on the surface of a substrate or in a ~~[[mould]]~~ mold, a first dispersion ~~[[containing]]~~ comprising:

at least one metallic compound in powder form ~~[[chosen]]~~ selected from ~~[[among]]~~ the group consisting of: transition metal-containing borides, carbides, and borocarbides ~~[[containing at least one transition metal, in powder form]]~~, and

a resin with a coke mass content equal to at least 30% after carbonization;

b) ~~[[dry]]~~ drying the dispersion deposited in step a);

c) optionally repeating steps a) and b) one or more times to form a dried deposit on the surface of the substrate or in the mold;

~~[[c)]]~~ d) ~~[[cross-link]]~~ cross-linking the resin present in ~~[[this]]~~ the deposit;

~~[[d)]]~~ e) ~~[[carbonize]]~~ carbonizing this cross-linked resin under an inert atmosphere;

~~[[e)]]~~ f) ~~[[cover]]~~ covering the ~~[[said]]~~ deposit containing the cross-linked, carbonized resin with a second dispersion ~~[[containing]]~~ comprising:

silicon in powder form, and

a binder; and

Art Unit: 1762

[[f]] g) [[heat]] heating, under an inert atmosphere, the covered deposit [[made]] produced in step [[e]] f) to a temperature equal to at least the melting temperature of silicon[[, under an inert atmosphere,]]  
~~steps a) and b) possibly being repeated one or more times before going onto step c).~~

**Claim 2 (currently amended)** The process according to claim 1, [[characterized in that]] wherein the metallic compound in powder form is [[chosen]] selected from [[among]] the group consisting of: hafnium borides, zirconium borides, titanium borides, hafnium carbides, zirconium carbides, and titanium [[borides and ]] carbides.

**Claim 3 (currently amended)** The process of according to either claim 1 or claim 2, [[characterized in that]] wherein the resin has a coke mass content equal to at least 45% after carbonization.

**\*\*\*Applicant is in no way obliged to amend the claims in this fashion, but adopting the examiner's suggestions is almost certain to overcome the above-mentioned objections and rejections, with the exception of the improper multiple dependency of claims 4-11.**

In amending claims 4-11, applicant is urged to maintain terminology that is consistent with, and finds proper antecedent basis in, the amendments made to claims 1-3. Further, with specific respect to claims 10 and 11 applicant is urged to review MPEP § 2173.05(q) to avoid rejections under 35 U.S.C. §§ 112 and 101 in subsequent Office actions.\*\*\*

### ***Claim Rejections - 35 USC § 103***

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

Art Unit: 1762

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**22. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gray (US 4,795,677 A) in view of Parkinson et al. (US 4,477,493 A).**

A. With respect to claim 1, Gray teaches all of the limitations of steps a)-d). Specifically, Gray teaches Ti, Zr, and Hf borides [6:28-54] and a coke content of 30-50% after carbonization [3:14-30]. Gray teaches the phenolic resin disclosed by applicant heated to the same temperatures disclosed by applicant [4:24-32]. Consequently, it is the examiner's position that Gray's phenolic resin is inherently cross-linked prior to or simultaneously with carbonization.

While Gray teaches subsequent protective over-coating with SiC, said over-coating is performed by CVD [5:29-55] and not by the process of claimed steps e) and f).

Parkinson teaches a process in which a carbonized composite is over-coated with a SiC layer produced in the manner of applicant's claimed steps e) and f) [2:25-3:51].

Consequently, it would have been obvious to one of ordinary skill in the art to modify the process of Gray so as to deposit the SiC protective over-coat according to the process of Parkinson (i.e., applicant's claimed steps e) and f)). One of ordinary skill in the art would have been motivated to do so by the desire and expectation of successfully providing a protective SiC over-coat.

B. With respect to claim 2, Gray teaches Ti, Zr, and Hf borides [6:28-54].

C. With respect to claim 3, Gray teaches a coke content of 30-50% after carbonization [3:14-30]. This range is inclusive of the 45% claimed. In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art a *prima facie* case of obviousness exists.<sup>1</sup>

### ***Conclusion***

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A. US 5,368,940 A teaches applicant's steps a)-d) but fails to teach steps e) and f). This reference has not been applied against the claims per MPEP § 904.03.

B. US 5,660,880 A and corresponding WO 94/14729 A1, cited in the IDS (10/24/2003), teach only applicant's steps a) and b), and a non-cross-linked carboxymethyl cellulose resin.

24. The prompt development of clear issues in the prosecution history requires that applicant's reply to this Office action be fully responsive (MPEP § 714.02). When filing an amendment, applicant should specifically point out the support for any amendment made to the disclosure, including new or amended claims (MPEP §§ 714.02 & 2163). A fully responsive reply to this Office action, if it includes new or amended claims, must therefore include an explicit citation (i.e., page number and line number) of that/those portion(s) of the original disclosure which applicant contends support(s) the new or amended limitation(s).

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<sup>1</sup> MPEP § 2144.05(I)

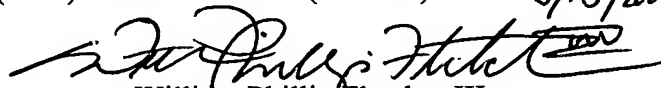
Art Unit: 1762

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William P. Fletcher III whose telephone number is (571) 272-1419. The examiner can normally be reached on Tuesday through Saturday, 0700h to 1730h.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

05/13/2006



William Phillip Fletcher III  
Patent Examiner (FSA), USPTO  
Art Unit 1762

Alexandria, VA